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आवश्यकताएं
(पहला पुनरीक्षण)

Basic Requirements for Cathode Ray
Tubes
(First Revision)

ICS 31.100

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FOREWORD

This Indian Standard (First Revision) was adopted by Bureau of Indian Standards, after the draft finalized by Electronic Display Devices and systems Sectional Committee, had been approved by the Electronics and Information Technology Division Council.

This Indian standard was first published in 1971. This revision has been brought out to bring the standard in the latest style and format of the Indian Standards.

This standard deals with the general aspects of cathode ray tubes used in oscilloscopes, television, radar, etc. and the format for the presentation of device data to be furnished for specific types of cathode ray tubes.

The object of preparing this standard on cathode ray tubes is to provide a guideline for specifying the properties of the tubes for the intended applications thus facilitating comparison and choice between similar products. It is considered desirable that the data sheets brought out by the manufacturers describing the performance and dimensions of these devices should contain as a minimum certain information and that this information should be quoted in the same terms by all the manufacturers. The adoption of this standard, it is expected, will assist in ensuring such uniform presentation of performance characteristics of cathode ray tubes.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***BASIC REQUIREMENTS FOR CATHODE RAY TUBES***(First Revision)***1 SCOPE**

This standard covers the basic requirements relating to cathode ray tubes, such as those used in oscilloscopes, television and radar and the format for the presentation of device data to be furnished for specific types of cathode ray tubes.

2 REFERENCES

The standard given below contains provisions, which through reference in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed as follows:

<i>IS No.</i>	<i>Title</i>
IS 1885 (Part 4/Section 4)	Electrotechnical vocabulary: Part 4 Electron tubes, Section 4 Cathode — Ray tubes — Electrotechnical vocabulary — Electronic tubes
IS 2032 (Part 9)	Graphical symbols used in electro technology: Part 9 Electron tubes and valves (other than microwave tubes and valves)
IS 5323	Letter symbols and abbreviations for electron tubes
IS 5627	Methods of measurement of radar and oscilloscope cathode — Ray tubes
IS 5840 (Part 1)	Dimensions of cathode ray tubes: Part 1 Tube outlines
IS 5840 (Part 2)	Dimensions of cathode ray tubes: Part 2 Bases
IS 6214	Specifications for phosphors for cathode ray tubes

3 TYPE DESIGNATIONS

3.1 The type designation of cathode ray tubes shall consist of number followed by two letter-numeral combinations, describing details as given in **3.1.1** to **3.1.3**.

3.1.1 The first number shall indicate the tube screen size in millimeters (diameter in the case of round tubes and diagonal in the case of rectangular tubes).

3.1.2 The next letter-numeral combination shall represent the type of tube. The letter shall be 'C' indicating that it is a cathode ray tube, the associating number indicating the tube type in the series of cathode ray tubes, depending upon its electrical and mechanical parameters.

3.1.3 The second letter-numeral combination shall indicate the type of phosphor used for the screen coating.

NOTE — Phosphor designation is based on accepted commercial designation. Reference may be made to IS 6214 (Specification for phosphors for cathode ray tubes). Thus in the type designation 70 C1P1, P1 represents the P1 type of phosphor corresponding to Sheet 1 of IS 6214.

4 DESIGNATION OF CATHODE RAY TUBE DEFLECTION PLATES**4.1 For Tubes Using Single Beam**

For tubes using single beam, the designation of the deflection plates shall be as follows:

- The plates responsible for the displacement of the spot in the X direction shall be designated X₁ and X₂; and
- The plates responsible for the displacement in the Y direction shall be designated Y₁, and Y₂.

4.1.1 The relative positions of the deflection plates as viewed from the neck end of the tube shall be as shown in Fig. 1.

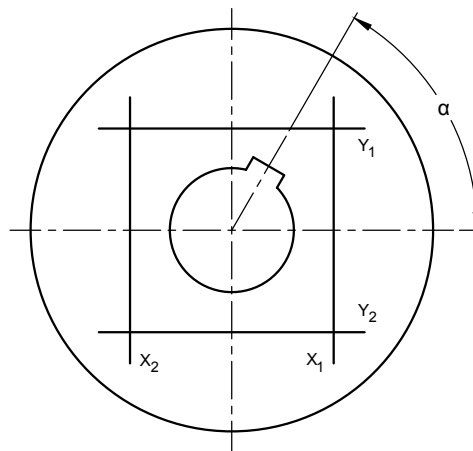


FIG. 1 RELATIVE POSITION OF DEFLECTION PLATES IN A SINGLE-BEAM CATHODE RAY TUBE

4.2 For Tubes Using Double Beam

For tubes using double beam, the designation of the deflection plates shall be as follows:

a) The plates responsible for the displacement of the spot in the X direction shall be designated X_1' and X_2' for the first beam and X_1'' and X_2'' for the second beam; and

b) The plate responsible for the displacement of the spot in the Y direction shall be designated Y_1' and Y_2' of the first beam and Y_1'' and Y_2'' for the second beam.

4.2.1 The relative positions of the deflection plates as viewed from the neck end of the tube shall be as shown in Fig. 2.

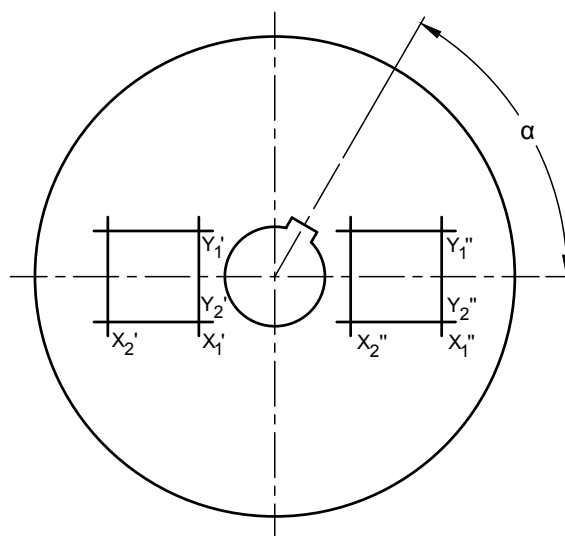


FIG. 2 RELATIVE POSITION OF DEFLECTION PLATES IN A DOUBLE-BEAM CATHODE RAY TUBE

5 SPECIFYING THE DEVICE DATA

5.1 All ratings for cathode ray tubes are based on absolute maximum rating system (*see* also Annex A).

6 PROFORMA FOR THE PRESENTATION OF DEVICE DATA

6.1 The proforma for the presentation of the device data shall include the following:

- a) Type designation — *see* **3**.
- b) Designation of deflection plates — *see* **4**.
- c) Electrode details
- d) Tube dimensions — *see* IS 5840 (Part 1)
Dimensions of cathode ray tubes: Part 1 Tube outlines.
- e) Base, base dimensions and base-pin connections - The base (such as phenolic molded, all glass), base dimensions [see IS 5840 (Part 2)], and base-pin connections to the various electrodes of the tubes shall be specified. The angle α between X axis and the key of the base shall always be specified (*see* Fig. 1 and 2).
- f) Screen types — The types of phosphor employed shall be specified by referring to the relevant sheet of IS 6214.
- g) Type of focusing — The type of focusing whether electrostatic or electromagnetic shall be specified.
- h) Type of deflection – The type of deflection whether electrostatic or electromagnetic shall be specified.
- j) Useful screen dimensions – Minimum useful screen dimensions shall be specified.
- k) Operating characteristics – The limiting values, that is the safe- maximum and minimum values for the operating characteristics such as electrode voltages and currents, electrical characteristics deflection factor, line width, and inter-electrode capacitance, shall be specified as applicable to the particular type of cathode ray tube.

NOTE — The values specified shall correspond to the methods of measurements prescribed in IS 5627.

7 ADDITIONAL INFORMATION

7.1 The manufacturer shall furnish additional details and the characteristics that may be necessary for specific applications.

ANNEX A
(Clause 5.1)

ABSOLUTE MAXIMUM RATING SYSTEM

A-1 Absolute maximum ratings are limiting values of operating and environmental conditions applicable to any electronic device of a specified type as defined by its published data, which should not be exceeded under the worst probable conditions.

A-2 These values are chosen by the device manufacturer to provide acceptable serviceability of the device taking no responsibility for equipment variations, environmental variations, and the effects of changes in operating conditions due to variations in the characteristics of the device under consideration of all other electronic devices in the equipment.

A-3 The equipment manufacturer should design so that initially and throughout life, no absolute maximum value for the intended service is exceeded with any device under the worst possible operating conditions with respect to supply voltage variations, equipment component variations, equipment control adjustments, load variations, signal variations, environmental conditions and variations in characteristics of the device under consideration and of all other electronic devices in the equipment.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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